

CRIS Reference ([For more information click here to open the current CRIS Manual](#))

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Topic Areas for Knowledge Areas (KAs):

Natural Resources and Environment: KAs 101-141

Plants and their Systems: KAs 201-216

Animals and their Systems: KAs 301-315

Agricultural, Natural Resource, and Biological Engineering: KAs 401-405

Food and Non-Food Products: Development, Processing, Quality, and Delivery: KAs 501-512

Economics, Markets, and Policy: KAs 601-611

Human Nutrition, Food Safety, and Human Health and Well-Being: KAs 701-724

Families, Youth, and Communities: KAs 801-806

Program and Project Support, and Administration, Education, and Communication: KAs 901-903

Topic Areas for Subjects of Investigation (SOIs):

Natural Resources and their Products

Soil and Land (0110-0199)

Water (0210)

Watersheds and River Basins (0310-0399)

Atmosphere (0410-0499)

Recreational Resources (0510-0599)

Trees, Forests, and Forest Products (excluding edible tree nut crops) (0610-0699)

Rangelands and Grasslands (0710-0799)

Wildlife and Natural Fisheries Management, Endangered Species (0810-0899)

Plants and their Products

Citrus (0910-0999)

Tropical/Subtropical Fruit (1010-1099)

Deciduous and Small Fruits (1110-1199)

Edible Tree Nuts (1210-1219)

Potato (1310)

Vegetables (1410-1499)

Grain Crops (1510-1599)

Pasture and Forage Crops (1610-1699)

Fiber Crops (1710-1799)

Oilseed and Oil Crops (1810-1899)

Tobacco (1910-1999)

Sugar Crops (2010-2099)

Ornamentals and Turf (2110-2199)

Miscellaneous and New Crops (2210-2299)

Weeds (2300)

Plants (2410-2499) (multiple crops, non-crop, and general)

Animals, including invertebrates, and their products

Bees, Honey and Other Pollinators (3010-3099)

Invertebrates (3110-3199)

Poultry (3210-3299)

Beef Cattle (3310-3399)

Dairy Cattle (3410-3499)

Swine (2510-2599)

Sheep and Wool (3610-3699)

Cultured Aquatic Animals (3710-3799)

Other Animals (3810-3899)

Animals (3910-3999) (multiple animals and general)

Microorganisms (4010-4099)

Food and Manufactured Resources

Food (not in plants or animals above) (5010)

Clothing and Textiles (5110-5199)

Agricultural Supplies (5210-5299)

Structures, Facilities, and Equipment (5310-5399)

Human Resources, Organizations, and Institutions

People and Communities (6010-6099)

Economy (6110-6199)

Marketing (6210-6299)

Other Technologies

Biological Cell Systems (7010)

Research on research management (not research management per se) (7110)

Research Equipment and Methods (7210-7410)

Knowledge Area Descriptions with Definitions

[\(Click here to return to instructions\)](#)

001 Administration

(This is not an official CRIS classification, but a catch all for administrative funds)

TOPIC I. NATURAL RESOURCES AND ENVIRONMENT

SOIL (Category)

KA 101. Appraisal of Soil Resources

Work in support of soil mapping is concerned with identifying the important soil parameters for use in crop production, site-specific management, forest and range resource evaluation, housing developments, zoning, waste management, environmental urban planning, and other land uses. Soil surveys can also be used to show soil characteristics such as spatial and temporal variability, susceptibility to frost heave or slippage, depth to water table, depth to rock or other impermeable barriers, bearing strength, flood hazard, and soil erosion potential that affect suitability of a site for specific uses.

KA 102. Soil, Plant, Water, and Nutrient Relationships

This knowledge area is concerned with the chemical and physical nature of interrelationships among soils, plants, water, and nutrients. The objective is to improve, maintain, or restore the inherent production capability of soils.

KA 103. Management of Saline and Sodic Soils and Salinity

This area is concerned with injurious accumulations of salts that may occur in the root zone of soil because salts move upward in the soil with water and are left behind as the water evaporates. Work in this area also concerns salts that can be leached downward to the groundwater or to a drainage system as the result of heavy rainfall or irrigation, as well as salinity and brackish water problems that may occur in seaboard areas.

KA 104. Protect Soil from Harmful Effects of Natural Elements

This work focuses on protection of soils from impairment as a result of natural events.

WATER

KA 111. Conservation and Efficient Use of Water

Work in this area attempts to increase efficiency in collecting, storing, conveying, using, and reusing available water resources.

KA 112. Watershed Protection and Management

This area is intended to focus on soil and water management problems at whole watershed scales, as opposed to problems of more localized scale. These watersheds include the cropland of the U.S. as well as range and forest lands. Work in this area can encompass one or more of the following: flood prevention systems, sediment control, wind and water erosion control, and management strategies oriented toward water yield and quality.

FOREST AND RANGE RESOURCES

KA 121. Management of Range Resources

This area includes work on biological processes and ecological relationships, improved range management techniques, and better appraisals of range conditions for production of livestock forage, water yield, and wildlife habitat.

KA 122. Management and Control of Forest and Range Fires

Work in this area focuses on both wildfire and prescribed fire. It includes the development of new wildfire prevention methods, new technology for fuel hazard reduction, improved systems for wildfire prediction, detection, and effective attack and suppression technologies. Prescribed fire is used to maintain fire-dependent ecosystems without endangering resources and facilities. Work in this area focuses on where, when, and how to utilize prescribed fire.

KA 123. Management and Sustainability of Forest Resources

Work in this area focuses on the biology of forest plants and trees; ecology of forest ecosystems; tree breeding; forest nursery practices; silvicultural techniques to improve and regenerate forest stands; and assessing, modeling, monitoring, and forecasting forest ecosystems. Forest resources include both wood and non-wood products, often referred to as non-timber forest products or special forest products. Sustainable forest management criteria and indicators are outlined in international protocols.

KA 124. Urban Forestry

This work concentrates on the use of trees to improve or maintain the quality of urban and suburban environments and to enhance natural beauty through tree plantings. Tree plantings for special purposes include: visual screening, noise suppression, air quality improvement, shade, and beautification. Identification and development of species capable of living under adverse conditions such as smoke, air pollution, compacted soils, deficient or excessive moisture, and other unfavorable conditions associated with urban environments is included in this category.

KA 125. Agroforestry

Work in this area focuses on agroforestry practices that intentionally combine trees or shrubs with crop or livestock operations, or use trees at the agriculture/community interface to help create more integrated, diverse, and sustainable farms, non-industrial forests, ranches, and rural communities. Agroforestry practices are designed to incorporate the use of trees into agricultural settings to accomplish social, economic, and environmental objectives. The main types of agroforestry include alley cropping, riparian buffers, forest farming, windbreaks/shelterbelts, and silvopasture. Agroforestry practices often yield non-traditional tree and forest products such as mushrooms, boughs, medicinal plants, vines, and nuts.

NATURAL RESOURCES, GENERAL

KA 131. Alternative Uses of Land

This area is concerned with evaluation of alternative uses of land to determine short- and long term benefits. Changes in land use in response to population growth, urban and suburban growth, recreational needs, agricultural and other factors affecting the fixed supply of land are included in this area.

KA 132. Weather and Climate

Work on the impact of weather and climate on agriculture and natural resources focuses on three tasks: (1) characterize existing climatic patterns and propose more effective ways of adjusting to these patterns, (2) specify modifications in management approaches that are desirable to farm, forest, and rangeland managers, and (3) learn how potential modifications affect agriculture or natural ecology.

KA 133 Pollution Prevention and Mitigation

Work in this area is concerned with preventing, alleviating, and mitigating pollution initiated by agricultural and forestry practices and its detrimental effects on agricultural plants, animals, soil, air, water, and humans. Potential pollutants include: organic pesticides, radio-nuclides, fertilizer chemicals, growth regulating chemicals, animal and crop wastes, mulching materials, pathogenic microorganisms, heavy metals, salts used on roads for de-icing, and allergens. This work focuses on agricultural production, not on health hazards to humans, which are covered in KA 723, Hazards to Human Health and Safety.

KA 134. Outdoor Recreation

Work on outdoor recreation focuses on the management of lands for recreation and the coordination of this use with other land resources. It involves problems in management of physical resources, as well as socioeconomic relationships of users of the resources.

KA 135. Aquatic and Terrestrial Wildlife

This area focuses on invertebrate and vertebrate animal species that occur naturally in forest, range, and agricultural lands and waters, and marine environments. Work includes determining biological and ecological requirements of species, factors influencing population dynamics, interspecific relationships, methods for

maintaining and enhancing habitats, and management approaches for sustaining wildlife harvests while maintaining population, species, and community viability.

KA 136. Conservation of Biological Diversity

In a natural resources context, work on biological diversity (biodiversity) conservation focuses on the description, measurement, assessment, and management of plant and animal variation in nature. It includes diversity at the genetic, species, and ecosystem levels in forest, range, and agriculturally-influenced ecosystems. The objective is to preserve, enhance, and restore natural biodiversity to levels compatible with societal uses of natural resources.

AIR

KA 141. Air Resource Protection and Management

This knowledge area focuses on investigations that quantify emissions, fate and transport, and practices to mitigate emissions of particulate matter and gases from agriculture and forestry practices. Work includes emissions from animal feeding operations, controlled burning, and tillage, and volatilization/transport to the atmosphere of naturally occurring or anthropogenic chemical compounds.

TOPIC II. PLANTS AND THEIR SYSTEMS

PLANT PRODUCTION

KA 201. Plant Genome, Genetics, and Genetic Mechanisms

This area focuses on development and dissemination of fundamental information in plant genetics and plant breeding technology with the purpose of making plant breeding more efficient and productive, and includes related technologies such as genomic database management.

KA 202. Plant Genetic Resources

This area focuses on discovery, acquisition, preservation, characterization, and development of plant genetic resources for plant production or protection. Both in-situ and ex-situ preservation methods are included, as well as preservation of species and within-species variation.

KA 203. Plant Biological Efficiency and Abiotic Stresses Affecting Plants

This area focuses on understanding and improving plant productivity and quality affected by reduced inputs or abiotic stresses such as water, temperature, or nutrients.

KA 204. Plant Product Quality and Utility (Preharvest)

This area focuses on maintaining or improving specific quality or utility parameters within biological material before harvest.

KA 205. Plant Management Systems

This area focuses on integration of production practices into an integrated system for managing annual and perennial plant population densities, fertility, irrigation, precision agriculture, and other cultural practices in an efficient and effective manner.

KA 206. Basic Plant Biology

This area focuses on inquiry into fundamental processes and mechanisms in plants and model organisms basic to the life of the plant.

PLANT PROTECTION

KA 211. Insects, Mites, and Other Arthropods Affecting Plants

This area focuses on yield and quality affected by indigenous and exotic insects, mites, and other arthropods (including bees and other pollinators).

KA 212. Pathogens and Nematodes Affecting Plants

This area focuses on yield and quality affected by indigenous and exotic bacteria, fungi, nematodes, viruses, and other pathogens.

KA 213. Weeds Affecting Plants

This area focuses on yield and quality affected by competition from indigenous and exotic weeds, including aquatic weeds and parasitic plants.

KA 214. Vertebrates, Mollusks, and Other Pests Affecting Plants

This area focuses on yield and quality affected by indigenous and exotic vertebrate pests (including birds and mammals), mollusks (including slugs and snails), and other plant pests.

KA 215. Biological Control of Pests Affecting Plants

This area focuses on classical, augmentative, or inundative use of natural enemies (including microbial biological control agents) to manage plant pests (pathogens, insects, mites, nematodes, weeds, vertebrates, etc.).

KA 216. Integrated Pest Management Systems

This area focuses on the integration of one or more control tactics into a system for managing single plant pests or pest complexes in an economically, socially, and environmentally sound manner.

TOPIC III. ANIMALS AND THEIR SYSTEMS

ANIMAL PRODUCTION

KA 301. Reproductive Performance of Animals

Work to enhance reproductive performance of agriculturally important animals involves factors that control reproduction or provide methodologies to improve reproductive efficiency, including efforts to control puberty, ovarian function and cycles, gamete formation and maturation, fertilization, establishment and maintenance of pregnancy, placental function, fetal development and growth, and parturition.

KA 302. Nutrient Utilization in Animals

Work in this area focuses on efforts to enhance the efficiency of nutrient utilization for improving animal productivity, including molecular and cellular biology of nutrient utilization, digestion, metabolic processes, and feed processing technology.

KA 303. Genetic Improvement of Animals

Work in this area focuses on improving production efficiency of agriculturally important animal species through more effective genetic improvement programs utilizing the development and application of expanded genetic information and technology encompassing molecular, quantitative, and statistical genetics.

KA 304. Animal Genome

Work in this area involves the application of new developments in molecular biology to map and understand the genome of agriculturally important animal species.

KA 305. Animal Physiological Processes

This area includes work on the fundamental physiological processes within the animal at the organismal, organ system, cellular, and molecular level.

KA 306. Environmental Stress in Animals

Work in this area involves stresses from the effects of climate, handling, and other environmental factors that decrease productivity, including extremes in temperature, humidity, air movement, and noise that may lead to lower reproduction, reduced feed efficiency, anorexia, reduced disease resistance, and increased mortality.

KA 307. Animal Management Systems

Work in this area focuses on the development and application of management systems, including computer technology/models and analytic methods, to improve management decisions and enhance animal production systems.

KA 308. Improved Animal Products (Before Harvest)

This area includes work to improve the composition and quality of animal products to reflect consumer preferences.

ANIMAL PROTECTION

KA 311. Animal Diseases

This area includes work on animal diseases that represent a threat to the production of an adequate and wholesome supply of animal products from livestock, poultry, and fish.

KA 312. External Parasites and Pests of Animals

This area includes work on pests and external parasites, including insects, ticks, mites, and other parasitic organisms that reduce animal productivity. This area also includes work on more cost effective methods of control.

KA 313. Internal Parasites in Animals

This area includes work on internal parasites such as various kinds of worms, flukes, and protozoa. Emphasis is on reducing losses, including those due to mortality, reduced yield and condemnation of meat, feed wastage, and cost of drugs.

KA 314. Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals

This area focuses on reduction of losses in productivity in livestock, poultry, and fish operations due to toxic chemicals, pesticides, poisonous plants, predators, ingestion of metal and other foreign bodies, and other hazards.

KA 315. Animal Welfare/Well-Being and Protection

Work in this area focuses on developing effective animal care and use programs, and information related to and contributing to the welfare, well-being, and proper stewardship of food animals.

TOPIC IV. AGRICULTURAL, NATURAL RESOURCE, AND BIOLOGICAL

ENGINEERING

KA 401. Structures, Facilities, and General Purpose Farm Supplies

Work includes the design, construction, and cost of facilities for animals, agricultural products, agricultural inputs, equipment, and other materials. The properties and behavior of animals, products, equipment, and materials while in various facilities and during transport or processing is a part of this work.

KA 402. Engineering Systems and Equipment

This work includes mechanization to increase efficiency and decrease labor requirements in agricultural and forestry production such as: grain, fruit and vegetable crops, timber, livestock, poultry, fish, and other animals. This includes machinery and power units for the pre- and post-harvest of various animal and plant products.

KA 403. Waste Disposal, Recycling, and Reuse

Work in this area includes all aspects of collecting, storing, transporting, treating, recycling, and utilizing waste products from agriculture, forestry, and other origins. The development of value-added or alternative products from waste products is included.

KA 404. Instrumentation and Control Systems

This work includes instrumentation and information systems that are important elements in all aspects of pre- and post-production agriculture. Sensors for detecting, monitoring, and processing of collected data and those that can provide improved control of the production and processing of biological materials, non-biological materials, and biohazards are included in this area.

KA 405. Drainage and Irrigation Systems and Facilities

Water management, to include surface and subsurface drainage and all irrigation systems, is part of this work. Equipment, system design, theory, modeling, installation, operation, and maintenance of drainage and irrigation systems for more efficient use of land, water, and capital resources are included.

TOPIC V. FOOD AND NON-FOOD PRODUCTS: DEVELOPMENT, PROCESSING, QUALITY, AND DELIVERY

FOOD

KA 501. New and Improved Food Processing Technologies

Work in this area focuses on development or improvement of methods, techniques, or processes to maintain or improve quality or functionality, stabilize or preserve foods, or prepare foods for further processing.

KA 502. New and Improved Food Products

This area includes work to improve or develop new food products. Work also includes development of knowledge to influence quality and functionality of foods in complex food systems.

KA 503. Quality Maintenance in Storing and Marketing Food Products

Work in this area includes understanding and minimizing food quality losses during preservation, storage, distribution, and marketing to enhance the quantity and quality of foods delivered to consumers, minimize food costs, and enhance profitability for food producers and marketers.

KA 504. Home and Commercial Food Service

This area of work focuses on development of guidelines to ensure the wholesomeness, nutritional value, taste, and appearance of commercially and home prepared foods. Work also includes development of approaches to improve preparation, handling, and storage of food that reduce waste, assure quality, and increase consumer appeal.

NON-FOOD

KA 511. New and Improved Non-Food Products and Processes

Work in this area includes agricultural commodities used in consumer products such as paper, textiles, biofuels, adhesives, paints, and other biobased products. This area also includes work on animal byproducts as raw materials for the textile, leather, soap, feed, pharmaceutical, and other industries. Work also includes alternate, non-food uses for agricultural commodities and timber products to expand markets for these products, yielding new, improved, or less expensive consumer products and providing additional sources of income to producers, processors, and marketers.

KA 512. Quality Maintenance in Storing and Marketing Non-Food Products

This area of work focuses on maintenance of quality of feeds, seeds, and other non-food agricultural and forest products during handling, storage, and marketing.

TOPIC VI. ECONOMICS, MARKETS, AND POLICY

KA 601. Economics of Agricultural Production and Farm Management

This work focuses on economic choices farmers and ranchers make to access and allocate resources for the production of commodities, services, and products. These resources help farmers and ranchers to minimize production risk and optimize farm income.

KA 602. Business Management, Finance, and Taxation

This work focuses on the management and administrative techniques applied to farming, agricultural business, and other businesses and enterprises to enhance planning, decision making, and resource use. These techniques help businesses make effective financial decisions, stay in the marketplace over the long term, and increase profitability. It includes the analysis of effects of taxation on profitability.

KA 603. Market Economics

This work focuses on activities that foster understanding of markets, productivity, agricultural competitiveness, and interregional trade, and give insight to the role and function of markets and their regulation primarily from the macroeconomic (industry) perspective.

KA 604. Marketing and Distribution Practices

This work concerns the distribution of products, goods, and services, the practices of buying and selling, and the development and improvement of markets primarily from the microeconomic (firm) perspective.

KA 605. Natural Resource and Environmental Economics

This work focuses on understanding economic relationships, decisions, and impacts relating to the management and use of public and private natural resources, and the environment. Work in this area also focuses on the economics of improving the efficiency of agricultural, forest, and rangeland use while minimizing negative impacts on the environment.

KA 606. International Trade and Development

This work focuses on the economic components of international trade and development, trade performance of sectors of the U.S. economy and that of other countries, globalization, barriers to trade, and trade and development impacts, especially as it relates to policy decisions. There is a strong focus on the global market economy, specifically the interaction between domestic and international market economies.

KA 607. Consumer Economics

This work provides insight and understanding into the demands, preferences, behavioral responses, and needs of individuals and consumers. This work provides insight and understanding about how consumer choice drives market economies, and how consumer policy, advertising, and other market forces influence consumer demand.

KA 608. Community Resource Planning and Development

This work provides understanding about community needs and preferences by providing local leaders and organizations the information, skills, and decision-making tools to help understand problems, identify opportunities, and plan for renewal and growth.

KA 609. Economic Theory and Methods

This work includes the development of economic theory and methodology to improve the knowledge base in a variety of topics.

KA 610. Domestic Policy Analysis

This work focuses on the economic and social impacts of domestic programs and policies, including the effect of government actions on the U.S. The work in this area analyzes the long term effects of government actions, which influences how the U.S. develops and implements policies.

KA 611. Foreign Policy and Programs

This work focuses on U.S. foreign policy goals, assessing the effectiveness and impacts of implemented policies and the interactions between foreign and domestic policies, and global implications.

TOPIC VII. HUMAN NUTRITION, FOOD SAFETY, AND HUMAN HEALTH AND WELL-BEING

HUMAN NUTRITION

KA 701. Nutrient Composition of Food

This area is concerned with the determination of the quantities of nutrients and other food components in food; development of analytical methods; development and maintenance of data banks of information on food composition; development of software and other systems to facilitate use of data on food composition, including recipe calculations; development and evaluation of educational materials and strategies on food composition; and dissemination of information on food composition for professionals, students, and the public.

KA 702. Requirements and Function of Nutrients and Other Food Components

This area concerns fundamental knowledge about relationships of food eaten by people to their physical development, physical activity, and mental status, and to the maintenance of optimal health. It is concerned with defining nutrient requirements and functions throughout the life span and in response to the environment. Functions include cellular and molecular regulation of gene expression by specific nutrients. This area is also concerned with development of methods to quantify relationships of nutritional status to well-being to provide a scientific basis for establishing Dietary Reference Intakes and Dietary Guidelines. Programs on nutrient requirements and function are concerned with the development and evaluation of education activities, strategies, and materials, and with the dissemination of related information for professionals, students, and the public.

KA 703. Nutrition Education and Behavior

This area is concerned with assessment of food intake and dietary patterns, the factors that influence food intake and dietary patterns, the interrelationships among these factors, and with the assessment of food and nutrient intake in relation to nutrient requirements, dietary guidance, and food plans. The focus is frequently on population groups at nutritional risk and on the factors that promote or hinder healthful food choices in these groups. Programs on dietary standards, guidance, food guides, and behavior change are concerned with the development, evaluation, and dissemination of education activities and strategies for professionals, students, and the public.

KA 704. Nutrition and Hunger in the Population

This area is concerned with food insecurity, insufficiency, and hunger in the population. Included are the development of analytical methods and pro-active attempts at hunger reduction through food banks, communities organizing to gain farmers markets, community gardens, gardening, food buying clubs, food recovery, and gleaning.

FOOD SAFETY

KA 711. Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Work on toxic residues of agricultural origin is conducted to determine the levels and circumstances under which chemicals may be safely used in production of plant and animal food products. There is widespread public concern over the potential hazards created by the use or introduction of chemicals in the production of farm products. The focus of work under this KA is on human health.

KA 712. Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

This area includes work on pathogenic foodborne microorganisms and parasites in raw, minimally processed, or inadequately processed and preserved foods. Work on mycotoxins and natural and induced toxicants in foods--including allergens and seafood toxins--is also included. The focus of work under this KA is on human health.

HUMAN HEALTH

KA 721. Insects and Other Pests Affecting Humans

This area includes work on insects, ticks, mites, and other pests that are an annoyance to humans. The emphasis is on developing safe, effective, and economical ways of controlling these pests.

KA 722. Zoonotic Diseases and Parasites Affecting Humans

Work in this area concerns animal diseases and parasites such as anthrax, encephalitis, leptospirosis, and rabies that pose potential threats to human health. Included are studies on epidemiology, risk assessment, biosecurity, and evaluation of efficacy of control programs for disease vectors.

KA 723. Hazards to Human Health and Safety

Work in this area is concerned with reducing hazards to the health, safety, and biosecurity of people involved in the production, processing, and distribution of agricultural and forest products. This area includes safety aspects of agricultural injuries and illnesses and methods for effective intervention. The emphasis is on immediate hazards to humans.

KA 724. Healthy Lifestyle

This area concerns activities related to healthy lifestyles, including maintenance of social, emotional, and physical health. The focus is on physical activity, exercise, stress management, and health-related practices including screening, immunization, and preventive care. The work in this area frequently involves population groups at risk and the factors that promote or hinder healthy lifestyles in these groups. Work is also concerned with development of a theoretical basis for behavior related to healthy lifestyles. Education and extension programs on healthy lifestyles and behavior change are concerned with the development, evaluation, and dissemination of education programs and strategies for professionals, students, and the public.

TOPIC VIII. FAMILIES, YOUTH, AND COMMUNITIES

KA 801. Individual and Family Resource Management

Work in this area provides an understanding of how individuals and families obtain and use resources of time, money, and human capital to achieve their standard of living and overall quality of life. This area is also concerned with factors affecting the decision-making process, such as availability of resources, life events, living patterns, values, goals, interests, and attitudes of families, and external forces such as public issues, policies, and programs.

KA 802. Human Development and Family Well-Being

Work on family and human development provides an understanding of the social, cognitive, emotional, and physical development of individuals and families over the human lifespan. The focus is on family and life cycle studies. Work in this area also provides a better understanding of family systems, family performance, and well-being.

KA 803. Sociological and Technological Change Affecting Individuals, Families, and Communities

Work in this area provides an understanding of the technological, demographic, and social changes occurring in society. Work also provides an understanding of the current and historic ways in which individuals, families, and communities cope with sociological and technological change, and includes activities that extend this knowledge to the population.

KA 804. Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

Work on social, aesthetic, and functional aspects of apparel and textiles provides a better understanding of the interface among producers, retailers, and consumers. This area also provides knowledge about the products of agriculture used in apparel and textiles and on factors that affect consumer choice. Work includes the social, economic, and design aspects of housing and other structures.

KA 805. Community Institutions, Health, and Social Services

This work addresses the development, quality, and functioning of community institutions and social services. Work in this area enhances the scope, scale, and effectiveness of public and private community institutions and services, including emergency preparedness and response, and public safety.

KA 806. Youth Development

Work in this area includes programs and activities that promote positive youth development, including 4-H. These activities extend knowledge to youth and convey a sense of belonging, teach life skills, and provide opportunities for mastery, competence, and independence. This work also includes a focus on the social and emotional development of program participants.

TOPIC IX. PROGRAM AND PROJECT SUPPORT AND ADMINISTRATION, EDUCATION AND COMMUNICATION

KA 901. Project and Program Design, and Statistics

This work focuses on program and project design and evaluation, experimental design, surveys, sampling, and statistical analysis.

KA 902. Administration of Projects and Programs

This work is focused on efficiency and effectiveness of research, education, and extension methods and proposals. Included in this is work on maximizing researcher, educator, and facility productivity, and on coordinating teaching, research, and extension efforts among scientists and educators throughout the nation.

KA 903. Communication, Education, and Information Delivery

This area of work focuses on educational processes, needs, and methods to achieve educational goals. Work includes development, use, and assessment of communication, information delivery, and technology transfer methods and systems. List topic- or discipline specific education under the appropriate KA.

KA 990 Unclassified

This is not an official CRIS classification, but a designation in LMD of a 'catch all' KA for projects not classified)

Subject of Investigation Codes

ADMINISTRATION

0001 Unofficial designation in LMD signifying funds are classified as Admin funding by the FDC used for the project.

NATURAL RESOURCES AND THEIR PRODUCTS (Topic)

Soil and Land (Category)

0110 Soil
0120 Land
0199 Soil and land, general

Water

0210 Water resources

Watersheds and River Basins

0310 River basins
0320 Watersheds
0330 Wetland and riparian systems
0399 Watersheds and river basins, general

Atmosphere

0410 Air
0420 Weather
0430 Climate
0440 Solar radiation
0499 Atmosphere, general/other

Recreational Resources

0510 Wilderness
0520 Campgrounds and picnic areas
0530 Parks and urban green space
0599 Recreational resources, general/other

Trees, Forests, and Forest Products (excluding edible tree nut crops)

0610 Conifer forests of the North
0611 Conifer forests of the South
0612 Conifer forests of the West
0613 Mixed conifer-broadleaf forests
0620 Broadleaf forests of the North
0621 Broadleaf forests of the South
0622 Broadleaf forests of the West
0630 Chaparral and shrub lands
0640 Tropical forests
0650 Wood and wood products
0660 Paper and pulp derived products
0670 Short rotation woody crops, including holiday trees
0680 Other products of the forest
0699 Trees, forests, and forest products, general

Rangelands and Grasslands

- 0710 Desert and semidesert shrub land and shinnery
- 0720 Pinyon-juniper
- 0730 Mountain grasslands, meadow, and alpine
- 0780 Grasslands, other
- 0790 Rangelands, other
- 0799 Rangelands and grasslands, general

Wildlife and Natural Fisheries Management, Endangered Species

- 0810 Finfish
- 0811 Shellfish
- 0812 Fish habitats
- 0819 Natural fisheries, other
- 0820 Wild birds
- 0830 Wild animals
- 0840 Fur-bearing animals
- 0850 Wildlife habitats
- 0860 Endangered species
- 0899 Wildlife and natural fisheries, general/other

PLANTS AND THEIR PRODUCTS

Citrus

- 0910 Grapefruit
- 0920 Orange
- 0930 Lemon
- 0999 Citrus, general/other

Tropical/Subtropical Fruit

- 1010 Banana
- 1020 Pineapple
- 1030 Papaya
- 1040 Mango
- 1050 Date
- 1060 Kiwi
- 1099 Tropical/subtropical fruit, general/other

Deciduous and Small Fruits

- 1110 Apple
- 1111 Apricot
- 1112 Cherry
- 1113 Nectarine
- 1114 Peach
- 1115 Pear
- 1116 Plum
- 1119 Deciduous tree fruits, general/other
- 1120 Blueberry
- 1121 Cranberry
- 1122 Strawberry
- 1123 Raspberry
- 1129 Berries and cane fruits, general/other
- 1130 Table grapes

1131 Wine grapes
1132 Raisin grapes
1139 Grapes, general/other
1199 Deciduous and small fruits, general/other

Edible Tree Nuts

1210 Filbert
1211 Pecan
1212 Almond
1213 Walnut
1219 Edible tree nuts, general/other
1310 **Potato**

Vegetables

1410 Beans (dry)
1411 Beans (fresh, fresh-processed)
1412 Peas (dry)
1413 Peas (fresh, fresh-processed)
1414 Lentil
1419 Leguminous vegetables, general/other
1420 Melons (includes cantaloupe, muskmelon, watermelon)
1421 Cucumber
1429 Cucurbits, other (includes pumpkin, squash, gourd)
1430 Greens and leafy vegetables (includes endive, lettuce, spinach, turnip greens, celery, rhubarb, parsley, asparagus)
1440 Cole crops (includes cabbage, kale, broccoli, brussels sprouts, cauliflower, kohlrabi)
1450 Sweet potato
1451 Onion, garlic, leek, shallot
1452 Carrot
1453 Yam
1454 Taro
1455 Cassava (or manioc)
1459 Rhizomes, tubers, bulbs, and root crops, general/other (for potato use 1310)
1460 Tomato
1461 Peppers
1462 Eggplant
1469 Solanaceous and related crops, general/other (for potato use 1310)
1470 Mushrooms and other edible fungi
1480 Sweetcorn
1499 Vegetables, general/other

Grain Crops

1510 Corn (for sweetcorn use 1480)
1511 Popcorn
1520 Grain sorghum
1530 Rice
1540 Hard red winter wheat
1541 Hard red spring wheat
1542 Soft red wheat
1543 Soft white wheat (includes club, western)
1544 Hard white wheat
1545 Durum wheat

1549 Wheat, general/other
1550 Barley
1560 Oats
1570 Rye
1599 Grain crops, general/other (includes buckwheat, millet, triticale)

Pasture and Forage Crops

1610 Pasture
1620 Warm season perennial grasses (includes dallisgrass, bluestems, bermudagrass)
1621 Cool season perennial grasses (includes bluegrass, bromegrass, fescue, orchardgrass, perennial ryegrass, timothy, wheatgrass)
1629 Perennial grasses, other
1630 Summer annual grasses (includes forage sorghums, sudangrass, sorghumsudangrass hybrids)
1631 Winter annual grasses (includes annual ryegrass)
1639 Annual grasses, other
1640 Alfalfa
1641 Trefoil
1642 Red clover
1643 Crownvetch
1644 Winter annual legumes (includes subterranean clover, arrowleaf clover)
1649 Forage legumes, general/other
1699 Pasture and forage crops, general/other

Fiber Crops

1710 Upland cotton
1711 Long fiber cotton
1719 Cotton, other
1720 Kenaf
1730 Hemp
1740 Ramie
1750 Agave
1799 Fiber crops, general/other

Oilseed and Oil Crops

1810 Cottonseed (for meal, oil, etc.)
1820 Soybean
1830 Peanut
1840 Castor
1841 Crambe
1842 Flax
1843 Safflower
1844 Sunflower
1845 Jojoba
1846 Coconut
1847 Palm
1848 Canola
1849 Cuphea
1850 Lesquerella
1851 Meadowfoam
1852 Rape
1853 Sesame
1854 Chinese tallow

1855 Tung
1899 Oilseed and oil crops, general/other

Tobacco

1910 Flue-cured tobacco
1920 Burley tobacco
1930 Cigar-type tobacco
1999 Tobacco, general/other

Sugar Crops

2010 Sugar beet
2020 Sugar cane
2030 Sweet sorghum
2099 Sugar crops, general/other

Ornamentals and Turf

2110 Ornamental trees and shrubs
2120 Herbaceous perennials and decorative greens
2121 Cut flowers, foliage, and greens
2122 Potted plants
2123 Bedding/garden plants
2129 Florist crops, other
2130 Turf (includes bentgrass, bermudagrass, bluegrass, dichondra, fescue, ryegrass, zoysia)
2140 Ground covers
2150 Aquatic plants
2160 Arboreta and botanical gardens
2199 Ornamentals and turf, general/other (includes cacti)

Miscellaneous and New Crops

2210 Chemurgic crops
2220 Medicinal crops, non-narcotic
2221 Narcotic plants
2230 Hops
2231 Mint
2232 Coffee
2233 Cocoa
2234 Tea
2235 Herbs and spices
2239 Flavoring and beverage plants, general/other
2240 Guayule
2241 Hevea
2242 Gums
2249 Rubber, gum, and resin plants, general/other
2299 Miscellaneous and new crops, general/other
2300 **Weeds**

Plants

2410 Cross-commodity research--multiple crops
2420 Noncrop plant research
2499 Plant research, general

ANIMALS, INCLUDING INVERTEBRATES, AND THEIR PRODUCTS

Bees, Honey, and Other Pollinators

- 3010 Honey bees
- 3020 Honey and honey products
- 3030 Non-honey apiary products
- 3090 Other Pollinators
- 3099 Bees, honey, and other pollinators, general

Invertebrates

- 3110 Insects
- 3120 Spiders, mites, ticks, and other arthropods
- 3130 Nematodes
- 3199 Invertebrates, general/other

Poultry

- 3210 Egg-type chicken, live animal
- 3220 Meat-type chicken, live animal
- 3230 Turkey, live animal
- 3240 Duck and goose, live animal
- 3250 Ratites (e.g., ostrich, emu, rhea), live animal
- 3260 Poultry meat
- 3270 Eggs
- 3280 Other poultry products
- 3299 Poultry, general/other

Beef Cattle

- 3310 Beef cattle, live animal
- 3320 Meat, beef cattle
- 3330 Other beef cattle products
- 3399 Beef cattle, general/other

Dairy Cattle

- 3410 Dairy cattle, live animal
- 3420 Butter
- 3430 Cheese
- 3440 Meat, dairy cattle
- 3450 Milk
- 3460 Ice cream
- 3470 Other dairy cattle products
- 3499 Dairy cattle, general/other

Swine

- 3510 Swine, live animal
- 3520 Meat, swine
- 3530 Other swine products
- 3599 Swine, general/other

Sheep and Wool

- 3610 Sheep, live animal
- 3620 Meat, sheep
- 3630 Wool fiber

3699 Sheep and wool, general/other

Cultured Aquatic Animals

3710 Catfish
3711 Trout
3712 Salmon
3713 Striped bass
3714 Tilapia
3715 Baitfish (minnows and shiners)
3716 Ornamental finfish
3719 Other cultured finfish
3720 Crawfish
3721 Marine shrimp
3722 Freshwater shrimp
3723 Oysters
3724 Clams and mussels
3725 Ornamental shellfish
3729 Other cultured shellfish
3799 Cultured aquatic animals, general/other

Other Animals

3810 Horses, ponies, and mules
3820 Goats, meat and mohair
3830 Pets (companion animals)
3840 Laboratory animals
3899 Other animals, general

Animals

3910 Cross-commodity research--multiple animal species
3999 Animal research, general

MICROORGANISMS

4010 Bacteria
4020 Fungi (includes yeast)
4030 Viruses
4040 Viroids, mycoplasmas, spiroplasmas, etc.
4050 Protozoa
4099 Microorganisms, general/other

FOOD AND MANUFACTURED RESOURCES

5010 **Food** (not readily associated with specific plant and animal products)

Clothing and Textiles

5110 Clothing/apparel
5120 Textiles
5199 Clothing and textiles, general

Agricultural Supplies

5210 Fertilizers
5220 Pesticides (includes herbicides, insecticides, fungicides, etc.)

5230 Feed and feed additives
5240 Seeds and other plant propagules
5299 Agricultural supplies, general/other

Structures, Facilities, and Equipment

5310 Machinery and equipment
5320 Houses (human residences), furniture, household equipment, non-textile furnishings
5330 Farm structures and related facilities
5340 Nonfarm structures and related facilities, including those used in marketing, storing, processing, and distributing functions, and for recreational uses
5350 Domestic and community water supply facilities and systems
5360 Drainage and irrigation facilities and systems
5370 Sewage and waste disposal facilities and systems
5399 Structures, facilities, and equipment, general/other

HUMAN RESOURCES, ORGANIZATIONS, AND INSTITUTIONS

People and Communities

6010 Individuals (as workers, consumers, members of society)
6020 The family and its members
6030 The farm as an enterprise
6040 Real estate
6050 Communities, areas, and regions, including states and their institutions and organizations
6099 People and communities, general/other

Economy

6110 Economy of the United States and sectors thereof
6120 International economy and sectors thereof
6199 Economy, general/other

Marketing

6210 Farmer cooperatives
6220 Marketing, processing, and supply firms other than cooperatives
6230 Marketing systems and sectors thereof
6299 Marketing, general/other

OTHER TECHNOLOGIES

(Use the following classifications only if the research is not targeted at one or more previously listed specific subjects of investigation)

7010 Biological Cell Systems
7110 Research on research management (not research management per se)

Research Equipment and Methods

7210 Remote sensing equipment and technology
7220 Sensory evaluation/analysis methods (human senses)
7299 Research equipment and methods, general/other
7310 Experimental design and statistical methods
7410 General technology

9900 Unofficial designation in LMD for research without an SOI designation

Field of Science Codes

Biological (Category)

1000 Biochemistry and biophysics
1010 Nutrition and metabolism
1020 Physiology
1030 Cellular biology
1040 Molecular biology
1050 Developmental biology
1060 Biology (whole systems)
1070 Ecology
1080 Genetics
1081 Breeding (updated 2013, previously contained in 1080)
1090 Immunology
1100 Bacteriology
1101 Virology
1102 Mycology
1103 Other microbiology (includes protozoology, phycology, etc.)
1110 Parasitology
1120 Nematology
1130 Entomology and acarology
1140 Weed science (noxious, invasive, and introduced)
1150 Toxicology
1160 Pathology
1170 Epidemiology
1180 Pharmacology
1190 Limnology

Social and Behavioral

3000 Anthropology
3010 Economics
3020 Education
3030 Information and communication
3040 History
3050 Law
3060 Political science
3070 Psychology
3080 Sociology
3090 Sensory science (human senses)
3100 Management
3110 Art and architecture
3111 Landscape architecture

Physical

2000 Chemistry

2010 Physics

2020 Engineering

2030 Geology

2040 Mineralogy

2050 Hydrology

2060 Geography

2061 Pedology

2070 Meteorology and climatology

2080 Mathematics and computer sciences

2090 Statistics, econometrics, and biometrics